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## **Thermal Space in Architecture**

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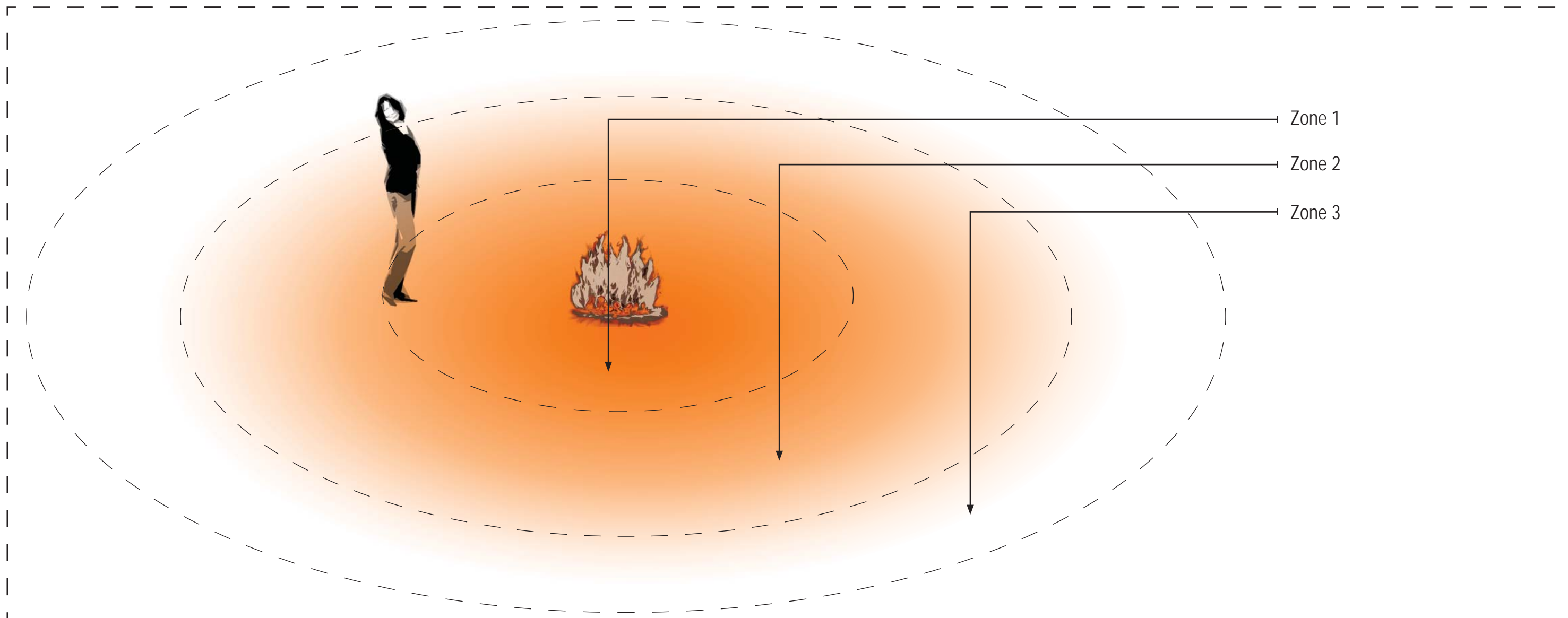
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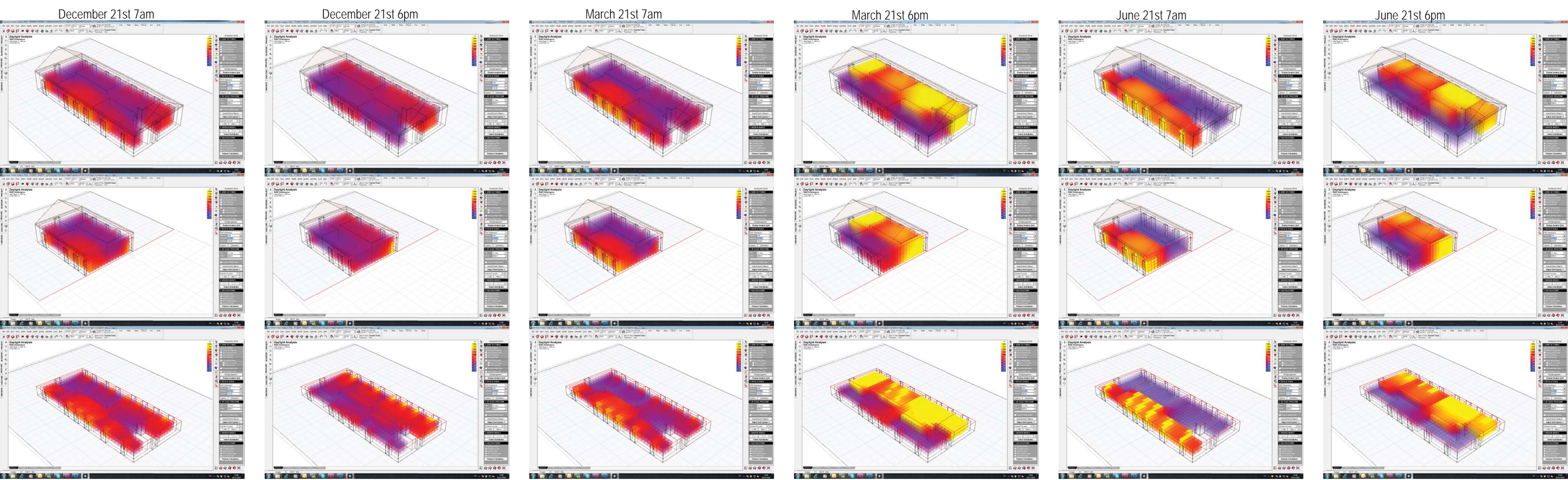


# Thermal space in architecture

Present research is revolving around the design process and the use of digital applications to support the design process among architects. This work is made in relation to the current discussions about sustainable architecture and the increased focus on energy consumption and the comfort in our buildings. However at the bottom of this lies an understanding of how we inhabit the space in our buildings and how we historically have adapted to the changing conditions of the seasons in our buildings. Through an increased understanding of this adaptability of and to our buildings, our work with spaces and understanding of spaces in buildings can change significantly and instead of the creation of frozen geometrical spaces, thermal spaces can be created as it is suggested in meteorological architecture where functions are distributed in relation to temperature gradients. This creates an interesting contrast to the current discussions about passive houses that today is starting to set the standards in a Scandinavian context, where the highly controlled indoor environment is in focus relying on mechanical ventilation, creating spaces with a narrow margin for comfort. One can raise the question if re-introducing an increased adaptability in the architecture can be a part of re-defining the environmental agenda and re-establish a link between the environment of the site and the environment of the architecture and through that an increased appreciation of the sensuous space here framed in discussions about thermal comfort.



Traditionally the fire has been the center point of the social life and created the point of focus. Starting with the inner social gathering point and from there through a the heating and lighting gradient from the fire defines more private zones for people to use as described by Banham. This can also be seen in the traditional use of the hearth in our houses where they have been the social gathering point. Illustrated in Herschings anecdote about the American family moving from their airconditioned house to a small village in France and the fireplace becomes the center for them in the winter time, whereas in the summertime the entire house and the streets are a part of their home and life. Here illustrated with the zones around the fire with the first as the social and the third as the more private.



Exploring the distribution of light in our buildings can help to determine different zones where the need for light differs. From the dimly lit more private and intimate zones to brightly lit zones for working. This can also reflect the thermal spaces where for example the dining area is evenly lit and with the occasional direct sun to create the warming sensation sitting in the sun during dinner or breakfast. Through the use of thermal storage the possibility of creating these different

warmer and colder zones that with light can help to emphasize the sensuous experiences of the space. Here the light conditions in a Danish singlefamily house are simulated to show the different zones created in the building. The question is how this can be made more elaborate and how the work can be expanded to a more deliberate use of thermal zones also and possibly the use of smells to enhance the experiences further as it is also suggested by Phillipe Rahm in his suggestion for meteorological architecture

The solar house of Thomas Herzog in Regensburg from 1979 shows an example of an onion principle similar to the different zones from the fire. However here it is strictly defined zones where the outer zone is a buffer between the outside environment whereas the inside is the warm core of the house defining the environment for the daily life and the central social functions. Here the thermal spaces play a more active role in the design of the building. The buffer creates a zone that during the warm summers functions as a part of the living area whereas it in the cold winters works as a conservatory pre-heating the air. However it requires the user is aware of these functions and do not see it as an essential part of the living space all year.

Zone one as a buffer between the core and heart of the building. In the winter a space that can be used and warmer than the outside, but not a place that is warm and comfortable as the core of the building

The core of the house is comfortable throughout the year. Naturally ventilated

